Fig. 3A

Long-Term Corrosion Study of Typical Low-Temperature High-Alumina (LTHA):

MATERIAL	WEIGHT LOSS
ZTA	-70 percent
SiC/SiC	-30 percent
LTHA Sample	-30 percent

Materials Corrosion Test:
Independent Test

Weight loss in mg/dm^2/day

46.7% Hydrofluoric (HF) acid @ 25°C

	5 day immersion	35 day immersion (30 after 5)
SiC-Silica flree	1.00	1.00
ZrO_2 - Toughened	1110.00	1070.00(1)
Al_2O_3 - 99.9%	1.92	2.26
LTHA Sample (Membrane-approx. 36% porosity)	1.0	0.16(2)
LTHA Sample (Solid)	1.64	0.09

NOTE: Weight loss is listed in mg/dm^2/day rounded to nearest 0.0lg.

(1): Approximately 2/3 of the coupon was destroyed in 35 days of testing.
(2): This is a rather severe test in that the surface area is approx. 36% greater than the normal as tested.

Materials Corrosion Test:

50% H_3PO_4 @ 25°C

	Cum. Mg/dm^2 (approx.)	
	24 Hours	120 Hours
AD90	5.35	9.65
AD94	2.72	5.00
AD96	4.82	12.54
ADO96	5.61	I 1.59
AD99.5	6.75	10.26
TTZ	0.88	3.33
LTHA Sample	1.66	2.02

3B 3B

30% NaOH @ 25°C

	Cum. Mg/dm^2 (approx.)	
	24 Hours	120 Hours
AD90	24.98	51.15
AD94	15.24	32.27
AD96	2.13	6.10
AD096	11.59	14.61
AD99.5	8.23	12.20
TTZ	0.61	0.61
LTHA Sample	1.72	2.01

NOTE: Weight loss is mg/dm^2/day, rounded to nearest 0.0lg.

Materials Corrosion Test:

	Weight loss in mg/cm^2/day	
	60% H_3PO_4 @ 60°C	30% NaOH @ 60°C
A479 Al_2O_3 (90%)	0.15	0.28
A479SS Al_2O_3 (99.5%)	0.07	0.12
3Nal$_2O_3$ (99.9%)	0.02	0.00
LTHA Sample	0.00	0.00

NOTE: Weight loss is mg/cm^2/day, rounded to nearest 0.0l g.

High Alumina Corrosion Test:
Independent Test

CORROSIVE SOLUTION	HCI	HNO_3	H_2SO_4
MATERIAL	% WEIGHT LOSS		
Product of Manufacturer A:			
85% Al_2O_3	0.066	0.076	0.066
96% Al_2O_3	0.081	0.087	0.200
LTHA Sample	(No Detectable Loss)		
Product of Manufacturer B:			
99.5% Al_2O_3	0.217	0.163	0.216

PROCEDURES

1. Check the initial weight (approximately 5 grams)
2. Immerse into high concentration acidlbase solutions
3. Dilute with 50 volume % of distilled water
4. Boil for an hour,and let soak overnight
5. Check the final weight
6. Calculate percent weight loss

% LOSS=(INITIAL WEIGHT - FINAL WEIGHT) /INITIAL WEIGHT

Fig. 3B